The AR4000 laser rangefinders measure from 0 to 16.5 meters to most diffuse surfaces. An eye-safe version is available that uses reflective tape. These sensors are suitable for a wide variety of distance measurement applications that demand fast sampling speeds and high accuracy.

Principles of Operation

The AR4000 laser rangefinders employ a modulated beam “time-of-flight” principle which measures the time light takes to travel to the target and back. The time delay is directly measured by comparing the signal from the laser with the delayed signal returning from the target. Acuity’s modulated beam rangefinders work on a patented range-to-frequency conversion principle, which offers several advantages over conventional phase shift measurement. Our sensors are used in medium-range applications that demand very fast sampling rates and high accuracy. Calibrated distance measurements from the AR4000 sensor are corrected for return signal strength, ambient light levels and temperature.

AR4000 Model Specifications units in inches [metric]

<table>
<thead>
<tr>
<th>AR4000 model</th>
<th>AR4000-LIR</th>
<th>AR4000-RET</th>
<th>AR4000-LV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span</td>
<td>0 - 650 in. [0 - 16.5m]</td>
<td>18 - 650 in. [0.45 - 16.5m]</td>
<td>0 - 480 in. [0 - 12.2m]</td>
</tr>
<tr>
<td>Linearity (standard deviation between 22 calibration points)</td>
<td>0.1 in. [2.5 mm]</td>
<td>0.3 in. [7.5 mm]</td>
<td></td>
</tr>
<tr>
<td>Resolution [mm]</td>
<td>0.0125 [0.32]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser power</td>
<td>8 mW infrared, 780 nm Class 3B</td>
<td>0.13 mW infrared, 780 nm Class 1, Eye Safe *Reflective tape required</td>
<td>5 mW visible, 670 nm Class 3A (3R Europe)</td>
</tr>
<tr>
<td>Laser spot size [mm]</td>
<td>0.1 [2.5] ; 0.5 mrad divergence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sampling rates

- RS232 (standard) 0.2 - 770 Hz or software trigger command, 38.4 Kbaud max
- RS422 (optional) 0.2 - 770 Hz or software trigger command
- 4-20 mA (optional) 0.2 - 1000 Hz
- PC104 or PCI interface (optional) 0.2 - 50,000 Hz ; PC interface card uses sensor's 0.5 V peak-to-peak square wave signal
- PCI-200 (optional) 0.2 - 200,000 Hz ; interface card resides in a PC bus

Power

- sensor requires 5 - 6 volts DC (400 mA at 5 V)
- heater requires 4.5 - 7 volts DC (4 Amp max)

Op. Temperature

-17 - 50°C when using installed heater for temperature stability

Weight, ounces [grams]

- 22 oz. [625] with cables

Environmental


Cable ft. [m]

- 6 ft. [1.8] for serial cable (DB9 termination) and power / signal cable; PVC jacket

Red – power 5 - 6 VDC (400 mA) Orange – heater power 4.5 - 7 VDC (4 A) Yellow – Temperature signal 0-5 V
Black – Ground Brown – heater return Green – Ambient light signal 0-5 V
Clear – Shield Violet – Amplitude signal 0-5 V Blue – Current loop or Pulse width

Rangefinder Accuracy versus Sample Rate
Mechanical Dimensions units in inches [mm]

AR4000 Sensor Options

- **High power lasers**: 20 mW upgrade for LIR model for high sample rates on dark targets and with bandpass filter
- **Additional outputs**: 4-20 mA signal or RS422 differential serial communications
- **Bandpass filters**: for applications near high ambient light or to glowing targets.
- **Power supply**: Universal AC power supply for sensor and heater power.
- **Specialized optics**: Close Focus Optics improve sensitivity up to 16 feet [4.8 m]
- **High Speed Interface Cards**: Increase sampling speed to 200 KHz using interface cards for PCI and PC104 format buses
- **Display**: Encased display with bright alphanumeric characters, serial input.
- **Cables**: Optional cable lengths. Contact us for custom cabling needs.

Laser Safety Labels

- Label for AR4000-LIR
- Label for AR4000-LV
- Label for AR4000-RET

Contact Acuity

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